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CERTIFICATE

IN THE MATTER OF
French application No. 99 00521
and IN THE MATTER OF
a Patent Application in UNITED STATES OF AMERICA

I, LAGRANGE Jacques, of Cabinet LAVOIX, 2, place d'Estienne d'Orves – 75009 PARIS (France), do hereby declare that I am conversant with the English and French languages and I am a competent translator thereof and That, to the best of my knowledge and belief, the following is a true and correct Translation into the English language of the French Application No. 99 00521 of January 19, 1999

Signed this March 30, 2005.

J. Lagrange

Jacques LAGRANGE

09/889,616

ER 99/00521
(/889,626)

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The Director-General of the Institut National de la Propriété Industrielle certifies that the attached document is a true copy of an application for industrial property titleright filed at the Institute.

Drawn up in Paris, 11 JUL. 2001

On behalf of the Director-General of the
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The Patent Department Head

(signature)
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REQUEST FOR GRANT

Confirmation of filing by fax ☐

This form is to be completed in black ink and in block capitals

Reserved for the INPI	
DATE OF SUBMISSION OF THE DOCUMENTS	19. JAN. 1999
NATIONAL REGISTRATION	99/00,521
DEPARTMENT OF FILING	75
DATE OF FILING	19 JAN. 1999

1. NAME AND ADDRESS OF THE APPLICANT OR THE REPRESENTATIVE TO WHOM THE CORRESPONDENCE IS TO BE ADDRESSED

CABINET LAVOIX
2 Place d'Estienne d'Orves
75441 PARIS CEDEX 09

No. of permanent power of attorney	Correspondent's references	Telephone
	BFF 98/0508	53-20-14-20

2. APPLICATION Nature of the industrial property right

☒ patent ☐ divisional application → initial application ↓

☐ utility certificate ☐ conversion of a European patent application ☐ patent ☐ utility certificate No. date

Compilation of the search report ☐ deferred ☒ immediate

The applicant, as a physical person, asks to pay the fee by instalments ☐ yes ☐ no

Title of the invention (maximum 200 characters)

PROCESS FOR THE TREATMENT OF A THIN BRITTLE METAL STRIP AND MAGNETIC COMPONENTS PRODUCED FROM A STRIP MADE OF A NANOCRYSTALLINE ALLOY.

3. APPLICANT(S) SIREN No. APE-NAF code

Name and forenames (underline the surname) or company name

IMPHY UGINE PRECISION

Legal form

Nationality/Nationalities French

Full address(es) **Country**

Immeuble La Pacific La Défense 7 11-13 Cours Valmy 92800 PUTEAUX FR

If insufficient space, continue on plain paper ☐

4. INVENTOR(S) The inventors are the applicants ☐ yes ☒ no If the answer is no, provide a separate designation

5. REDUCTION OF THE RATE OF FEES ☐ requested for the first time ☐ requested prior to filing; attach copy of the favourable decision

6. PRIORITY DECLARATION OR APPLICATION FOR THE BENEFIT OF THE FILING DATE OF A PRIOR APPLICATION

Country of origin	Number	Filing date	Nature of the application

7. DIVISIONS previous to the present application	No.	date	No.	date

8. SIGNATURE OF THE APPLICANT OR REPRESENTATIVE (name and capacity of the signatory - registration No.)	SIGNATURE OF THE RECEIVING OFFICIAL	SIGNATURE AFTER REGISTRATION OF THE APPLICATION AT THE INPI
CABINET LAVOIX M. MONCHENY No 92.1179 (signature)		(illegible signature)

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PATENT, UTILITY CERTIFICATE

DESIGNATION OF THE INVENTOR
(if the applicant is not the inventor or the sole inventor)

PATENTS ADMINISTRATIVE DIVISION
26bis, rue de Saint-Pétersbourg
75800 Paris Cédex 08
Tel: 01 53 04 53 04 - Fax: 01 42 93 59 30

NATIONAL REGISTRATION NO.
99/00,521

TITLE OF THE INVENTION:
PROCESS FOR THE TREATMENT OF A THIN BRITTLE METAL STRIP AND MAGNETIC COMPONENTS PRODUCED FROM A STRIP MADE OF A NANOCRYSTALLINE ALLOY.

THE UNDERSIGNED

IMPHY UGINE PRECISION
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DESIGNATE(S) AS INVENTOR(S) (surname underlined, forenames, address):

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60250 ANSACQ FRANCE

NOTE: In exceptional cases, the name of the inventor may be followed by that of the company to which he belongs (membership company) when the latter is other than the company which is the applicant or proprietor.

Date and signature(s) of the applicant(s) or of the representative

Paris, 19 February 1999

CABINET LAVOIX
M. MONCHENY No 92.1179
(signature)

DOCUMENT CONTAINING AMENDMENTS

(FRENCH) PAGE(S) OF THE DESCRIPTION OR OF THE CLAIMS OR SHEET(S) OF DRAWINGS			R.M.*	DATE OF THE CORRESPONDENCE	DATE STAMP OF THE CORRECTOR
Amended	Omitted	Added			
p 22 to 27			X	12.05.00	E M 20 SEP. 2000

* A change made in the wording of the original claims, unless the change derives from the provisions of Article R.612-36 of the Intellectual Property Code. is indicated by the reference "R.M." (amended claims).

The invention relates to a process for the treatment of a thin brittle metal strip and products obtained from the treatment of the strip, which may comprise forming operations such as a cutting operation. In particular, it relates to a process for obtaining components for magnetic use by cutting them from a metal strip having a nanocrystalline structure.

It has been proposed to manufacture thin strip of a magnetic alloy, and in particular an alloy having a high permeability, which has a structure mainly consisting of very fine grains in an amorphous matrix, the size of which grains may, for example, be between 1 and 100 nm. Such alloys are called nanocrystalline alloys.

Nanocrystalline metallic materials are obtained, in the form of thin strip, for example having a thickness of around 20 μm, from amorphous strip or ribbon produced by casting and rapidly cooling a liquid metal on a cooled roll or between two cooled rolls. The amorphous strip or ribbon is heat treated by holding it at a temperature of around 550°C for a time of around one hour so that it develops a nanocrystalline structure within a substantial part, for example more than 50%, of its volume.

This heat treatment may be preceded by prior heat treatments at lower temperatures, for example of around 200°C.

When magnetically soft iron-based alloys are cast, cooled and then heat treated, it is possible to obtain, from the strip in the nanocrystalline state, products such as magnetic circuit cores exhibiting excellent magnetic properties which cannot be generally obtained in the case of materials whose structure is different from a nanocrystalline structure.

However, a drawback of strip or ribbon having a nanocrystalline structure is that such strip or ribbon is very brittle so that the slightest mechanical stress results in the strip or ribbon fracturing. It is not